Reprinted from the New York Medical Journal for January 29, 1887.

A NEW METHOD OF TESTING THE "KNEE-KICK."

By WARREN P. LOMBARD, M. D.

It is the desire of the writer to call the attention of physicians, and more especially of those interested in nervous diseases, to a very simple and delicate method of testing the so-called tendon reflex of the knee, or "knee-kick." Aside from its precision, this method will recommend itself to the practitioner because it can easily be employed on patients who are confined to the bed. As soon as a convenient method of striking the ligamentum patellæ a blow of known force has been devised, the method will gain a new importance, because it lends itself readily to simple means of recording the extent of the movement, and will thus enable the physician to keep an accurate record of the condition of his patient, and of the changes which the "knee-kick" may undergo in the course of disease.

Last winter the writer made a series of experiments, in the physiological laboratory of the College of Physicians and Surgeons, upon the time required for the development of a contraction of the quadriceps muscle in response to a blow on the ligamentum patellæ, as compared with the intervals elapsing when the muscle was stimulated directly by a faradaic current, and reflexly by an irritant applied to the skin near the knee ("American Journal of the Medical Sciences," January, 1887, p. 88). These experiments demanded a more delicate means of testing the "knee-kick" than any in general use. After a time an appliance was found which satisfied all the requirements. It is unnecessary to describe the method followed in this laboratory research, for it is not feasible for the general practitioner; the following imitation of this method, however, can be employed in all places and at all times.

Let the patient lie on his side, the leg to be examined being uppermost. Place a cushion or roll of cloth between the thighs, so as to separate the knees, and, as far as possible, to fix the thigh of the limb to be studied. Support the foot of the leg to be examined by a sling, formed of a loop of bandage, or of a towel, suspended from a cord. Grasp the cord as far from the foot as may be, letting the hand be directly over the ankle, that the leg may swing freely and the degree of flexion of the knee be determined entirely by the tension of the muscles. Strike the ligamentum patellæ with an instrument which has a rounded edge and which is considerably heavier than the ordinary percussion hammer.

Improvements upon this method will readily suggest themselves; such as to make the thigh immovable by letting it rest in a splint which is molded to its inner and posterior surface, and which is fastened to a firm support: to fix the foot in a suitable swing; and to let the cord from which it is suspended come from a pulley at the ceiling.

By means similar to those described, a marked "knee-kick" may often be got from a patient who by the ordinary methods of examination would exhibit little or none. The delicacy of the method depends on the fact that the muscle is relieved of the weight of the leg, and its slightest contraction can, therefore, cause a visible movement. By this means some rather curious results have been obtained. A marked "knee-kick" was observed in the case of one subject during sound sleep. The re-enforcements described by Dr. Weir Mitchell ("Medical News," February 13 and 20, 1886) were admirably illustrated. In short, the method seems to meet all the requirements of the investigator.

The extent of the motion of the foot, and consequently of the contraction of the quadriceps muscle, may be recorded by the following simple arrangement: A string may be fastened by one end to the heel, and by the other to a strip of elastic, which, in turn, is attached to a firm upright support. The support can then be placed in such a position that the string shall be tense, shall be horizontal, and shall form a right angle with the long axis of the leg. The writing mechanism may consist of a piece of wire bent to form a T, the horizontal arms of which can be fastened to the string, while the free end of the stem can rest on a paper, coated with lamp-black, and secured to a board, which is placed directly beneath.

A contraction of the quadriceps muscle will extend the leg, stretch the elastic, and, by drawing the wire across the blackened surface, leave a record of the extent of the movement. Such a tracing can readily be fixed by passing the paper through the ordinary brown shellac varnish. Crude as such a method is, it would enable valuable records to be obtained with but little trouble.

Lombard (W. P.)

A new method of testing the "Knee-Kick"